feet or higher, the mountain hemlock is most efficient, for not only is its foliage dense, but its tapering spire-like crown offers but little resistance to falling snow.

In the light of the above facts forests may be too dense as well as too thin for the maximum conservation of snow. The ideal forest seems to be one filled with glades whose area bears such proportion to the height of the trees that the wind and the sun can not reach the bottom. These glades can be produced by the forester by judicious pruning and cutting as well as by proper planting. However, the mountain hemlock requires little or no pruning to attain its maximum efficiency.

In the field of hydrology, surveys of snow on the Mount Rose and Lake Tahoe watersheds have been made since the beginning of 1910 to indicate to ranchers and power companies in the basin below the amount of water to expect during the season, and thereby to assure the better control of the reservoirs. This work will be extended to include a study of the behavior of snow on typical slopes during rising temperature and wind with the view of forecasting the probability and extent of floods. For the purpose of offering foresters in the national forests and others the advantage of the investigations in snow a course is now planned at the University of Nevada on the relation of mountains and forests to the conservation of snow, including the improvement of the storage of snow by the planting and pruning of forests to assure the control of stream flow and the increase of irrigation and power resources. Other courses in general meteorology have already been provided.

The staff of the observatory consists of Professor S. P. Fergusson, formerly first assistant at Blue Hill Observatory, who is associate meteorologist, Mr. Arthur L. Smith, observer in Lake Tahoe Basin, and the writer, who is in charge.

Besides annual reports and news bulletins, the more important recent publications are Experiment Station Bulletin No. 79, "The Avoidance and Prevention of Frost in the Fruit Belts of Nevada," and an article on the "Conservation of Snow: Its Dependence on Forests and Mountains," in *Scientific American Supplement*, Vol. LXXIV, No. 1914 (September 7, 1912), pp. 152–55. A bulletin containing an elaborate presentation of the relation of mountains and forests to the conservation of snow is now being prepared.

J. E. CHURCH, JR.

RENO, NEVADA

SPECIAL ARTICLES

THE CULTIVATION OF AN ECTOPARASITIC NEMATODE OF A GUINEA-PIG ON BACTERIOLOGIC MEDIA[1]

ON May 6, 1912, while examining a guinea-pig which had died of an unknown cause, it was noted that the skin around and just anterior to the external genitalia was excoriated and covered by a yellowish, cheesy exudate. On examining the exudate under the low power, a large number of actively motile embryonic and adult nematodes were found. On May 7 a second guinea-pig exhibiting a similar, but less extensive, lesion and harboring the same ectoparasitic nematodes was discovered. Lately, a third guinea-pig was encountered, harboring the same nematode not only around the external genitalia, but also on the normal skin of the abdomen and thorax. Careful examination of these and of a number of other guinea-pigs has failed to reveal the presence of the nematode in the gastro-intestinal tract or in any of the internal organs.

A little of the caseous material from the first two guinea-pigs was inoculated onto moist earth and slants of Musgrave's amœba agar and kept at room temperature (about 24° C.). In a few days, a large number of actively motile nematodes were found in these cultures. The amœba agar cultures have, since then, been carried through five subcultures and the worms have also been successfully carried through several subcultures on slants of plain agar and ascites agar. The plain agar and the amœba agar have proved to be the best media, because the accompanying bacterial growth is relatively limited in amount. In several of the above subcultures

[1] A preliminary note, from the laboratory of the Cincinnati Hospital.

the worm has been seen to pass through two complete cycles of development. In one subculture the worms have multiplied and remained actively viable for 23 days, without transplantation.

A striking peculiarity of the growth on the agar cultures is the tendency of the worms to crawl up on the side of the test-tube opposite the slant and there clump themselves into macroscopic groups. Under the low power, these groups are seen to consist of an immense number of very actively motile nematodes in all stages of development.

As yet, we have not determined the exact species of this nematode, but in all probability it belongs to the Anguillulidæ.

N. B.—Since the above was written we have learned from Professor Henry B. Ward of similar cultivation experiments carried out in his laboratory by H. Metcalf.[2]

WADE W. OLIVER

RECENTLY PROPOSED SPECIES OF THE GENUS DICERATHERIUM

SINCE the opening of the Agate Spring fossil quarries in the Miocene formation of Sioux County, Nebraska, by the Carnegie Museum field parties some eight or nine years ago, there has been great activity by many institutions and private parties in this general field. As a consequence much material of fossil remains has been gathered, of which the greater portion, especially in the Agate Spring fossil quarries, consists of bones pertaining to the Rhinocerotidæ.

Pending the publication of a more extended work on the American Diceratheres, now in progress, the purpose of this note is to avoid the recurrence of certain interpretations on the part of students interested in the question of deciduous and permanent teeth.

In recent years there have been a number of new species described of Professor Marsh's genus *Diceratherium* which will be duly considered later. In 1908 Professor Loomis, of Amherst, proposed a number of new forms.[1] One of these (*D. aberrans,* p. 59) is established on a second deciduous cheek-tooth of the left side. Very recently Mr. Harold J. Cook has unfortunately used deciduous teeth as a type of still an additional species *D. loomisi.*[2] The type of this latest species consists of a portion of the right upper maxilla, containing not P^4, M^1 and M^2, as Cook states, but the second, the third and the fourth deciduous cheek-teeth. This is abundantly demonstrated in the large collection from the Agate Spring fossil quarries now under study in the Carnegie Museum.

In this connection it is well to state that the formation of the permanent premolars 2, 3, 4 of *Diceratherium* starts comparatively late. I have excavated maxillæ (Nos. 2464, 2476, Carnegie Museum) of young specimens and often find that while the deciduous 2, 3 and 4 are considerably worn the germ of P^2, which is located immediately above the roots of D^2, is only very slightly and more often not at all indicated. At the same time P^1, which is erupted in an early stage, is on an even grinding plane with the milk teeth and has received considerable wear; more than half of the grinding surface of M^1 appears through the alveolar border, while M^2 is represented by a large excavation immediately back of M^2. In comparing Mr. Cook's figures (*l. c.,* p. 31) I judge that he has described a young specimen of *D. cooki* in the stage of development described above. In a later stage of development (specimen No. 1848) the formation of the permanent premolars is well advanced, especially in 2 and 3. M^1 is completely erupted, M^2 appears in a large triangular opening of the alveolar border, while M^3 is represented by a similar excavation to that of Nos. 2464 and 2476 above described. Thus it is repeatedly demonstrated that a large collection of a genus or species is extremely useful as a safeguard against the misinterpretations of which the systematists are surrounded.

O. A. PETERSON

[1] *American Journal of Science,* Vol. XXVI., pp. 51–64, 1908.

[2] Nebraska Geological Survey, Vol. VII., Part 4, pp. 29–32.

[2] "Cultural Studies of a Nematode Associated with Plant Decay," *Trans. Amer. Microscop. Soc.,* 1903, 24, p. 89.